A7. Economic Analysis – Water Supply Cost and Benefits

Attachment 7 identifies the costs and water supply benefits attributed to the seven projects proposed for implementation in the Santa Barbara County Region Proposition 84 (Prop 84) IRWM Implementation Grant Application – Round 1 (Proposal). The monetized water supply benefits for the Proposal total $2.6 million.

This suite of projects can best be framed by the mutual challenges faced by both the state and the region. This Proposal aggressively meets these challenges that include persistent drought, a collapsing Bay-Delta ecosystem, need for equitable distribution of benefits among communities, aging infrastructure, poor water quality, and climate change.

The region takes aim at the challenge of drought and the need to reduce dependence on the Bay-Delta with a suite of water use efficiency and water recycling projects. Water use efficiency is a long-term supply option that not only reduces water use and stretches existing supplies but saves considerable capital and reduces operating costs. Furthermore, the region answers the challenge of improving water quality with advanced technology to treat water to a higher level that will improve ocean water quality and result in higher-quality recycled water. It answers the challenge of climate change with projects that reuse, conserve, and match water use to water quality. It answers the challenge of outdated infrastructure with projects that update water distribution systems, water treatment facilities, and flood control facilities—all with the additional benefit of enhancing ecosystems.

Each of the seven Projects included in this Proposal achieves significant benefits. However, because Project 7 is a feasibility study with no quantifiable benefits until implementation of potential distribution systems and tertiary treatment facilities following the feasibility study, Project 7 is not included in the economic analysis per Department of Water Resources (DWR) instructions.

Several projects included in this Proposal target local and regional water supply reliability by:

- Reducing water demand by increasing water reuse and water conservation measures to increase and extend existing water supplies
- Improving operational efficiency and supply reliability
- Increasing water supply in the most cost-efficient and reliable manner

PROJECT 1:

City of Lompoc, Lompoc Valley Leak Detection and Repair Project

Project 1: City of Lompoc, Lompoc Valley Leak Detection and Repair Project

The City of Lompoc (Lompoc), Mission Hills Community Services District (MHCSD), and Vandenberg Village Community Services District (VVCSD) are cooperating to complete the Lompoc Valley Leak Detection and Repair Project (Project 1 or Project), a leak detection audit and repair program of their water distribution sytems.

Lompoc estimates an overall 6 percent water loss within its water distribution system, while MHCSD and VVCSD estimate up to 15 percent water loss. These estimates are based on system assessments conducted by each of the three Project proponents. In the past, the proponents have responded to water distribution losses as they are found, and an overall water distribution system leak detection audit has not been completed. The Project proponents anticipate that the leak detection survey would help reduce water loss, avoiding unnecessary groundwater pumping and water treatment and distribution costs.

The benefits of a leak detection and repair program are extensive. The benefits may not only include water savings and conservation but reduced production costs (for example, energy and operations and maintenance [O&M]), emergency repairs, administration costs, property damage, risk for lawsuits, insurance and legal fees, and improved public relations (Appendix 7-1, Leak Detection Benefits). The benefits associated with Project 1 are summarized in Exhibit 7-1. A comparison of the costs and benefits is provided in Exhibit 7-2.

EXHIBIT 7-1
Project 1 Benefit Overview

Type of Benefit	Assessment	Beneficiaries
Water Supply Benefits		
Avoided Water Supply Costs		
Avoided groundwater pumping	Monetized	Local
Avoided water treatment costs	Monetized	Local
Avoided power costs	Monetized	Local
Increased groundwater supply	Qualitative	Local
Water Quality and Other Excepted Benefits (Attachment 8)		
Improved air quality	Qualitative	Local/state

EXHIBIT 7-2
Project 1 Benefit and Cost Summary

Type of Benefits/Costs	Present Value
Capital and O&M Costs	$660,970
Quantitative Benefits	
Avoided Water Supply Costs	$1,142,380
Avoided groundwater pumping	Component of avoided water supply costs
Avoided water treatment costs	Component of avoided water supply costs
Avoided power costs	Component of avoided water supply costs
Improved air quality	Reduction of 2.9 million pounds of carbon dioxide emissions
Qualitative Benefits	Qualitative Indicator
Increased groundwater supply	+

Notes:
+ indicates net benefits are likely to increase with Project
++ indicates net benefits are likely to increase significantly with Project
O&M = operations and maintenance

Costs

The cost to implement the Project, including leak detection and repair, will be $448,630 with 85 percent of the Project spent in the first year and 15 percent in the second year. Annual administration costs total $4,325. Annual operation and maintenance costs will start at $5,675 and $15,000, respectively, in 2013, then reduce to $3,000 and $10,000 in 2015 as the number of leaks is significantly reduced. Replacement costs for leak detection equipment will total $75,000 in 2031 and 2051. The total present value of costs for the Project over its useful life is $660,970 (Table 11-1).

Water Supply Benefits

Avoided Water Supply Costs

Without the Project, Lompoc, MHCSD, and VVCSD would continue to rely on groundwater for their water supply. Projected groundwater use in the Lompoc Basin for M&I use is approximately 6,000 acre-feet per year (AFY) (Appendix 7-1, Lompoc Urban Water Management Plan).

With the Project, Lompoc will avoid pumping 43 AFY; MHCSD will avoid pumping 57 AFY; and VVCSD will avoid pumping 113 AFY. The total marginal cost of water for each agency is: (1) City: $879 per acre-foot (AF), (2) MHCSD: $218 per AF, and (3) VVCSD: $331 per AF. These costs include pumping and marginal treatment and distribution cost for each AF. Lompoc's marginal cost of water is higher than MHCSD and VVCSD because it utilizes a conventional water treatment process to soften the water with lime and caustic soda, which requires a higher treatment and disposal cost than the other two districts. MHCSD and VVCSD only use a very simple and less costly filtration and chlorination system, which results in a much lower cost of water per acre

foot. The combined avoided annual cost of groundwater pumping, treatment, and distribution for all three agencies is $87,626. The present value of the avoided cost of water supply over the life of the Project is $1,142,380 (Table 13-1).

Increased Groundwater Supply

Project 1 would avoid an average of 213 AFY of groundwater pumping, effectively conserving that water. By foregoing groundwater extraction in the Lompoc Basin, the area agencies would be increasing the groundwater supply for drought conditions in the area, increasing groundwater supply reliability in the future. It is difficult to monetize the value of added supply reliability provided by the avoided groundwater pumping; therefore, this benefit is discussed qualitatively. However, the benefits from supply reliability could be significant into the future with population growth estimates in Lompoc alone totaling 10,000 individuals by 2025 (Appendix 7-1, Lompoc Urban Water Management Plan).

Distribution of Benefits and Identification of Beneficiaries

The avoided groundwater pumping and supply reliability enhancement will be a benefit to the residents within the service areas of the City of Lompoc and those served by MHCSD and VVCSD.

Benefits Timeline

The estimated life of the Project over the period of analysis is 48 years. The Project will begin in 2011, and benefits will begin in full in year 2013, after initial Project implementation and leak repair. Leak repair activities will occur throughout the Project life, maintaining the anticipated system loss total to less than 1 percent.

Potential Adverse Effects

Project 1 will cause minor disturbances that will be mitigated, and there are no long-term impacts expected as a result of the Project. Any unforeseen temporary impacts will be mitigated. Portions of Lompoc, which are subject to the Cultural Resources Overlay (CRO), will be excluded from repair or replacement of water mains and/or service lines, as part of this Project. Leaks found in the CRO areas will be repaired at a later date, because ground disturbance within these areas requires the presence of a National Register Qualified Archaeologist and would significantly increase the costs of implementation. The only exception will be major leaks that are determined to be a high priority for repair by staff. These repairs will require the presence of a National Register Qualified Archaeologist.

Summary of Findings

The water supply benefits of Project 1 will be from the avoided groundwater pumping, treatment, and distribution costs. Lompoc, MHCSD, and VVCSD will in total avoid approximately $1,142,380 in costs over the life of the Project, which would not occur without Project implementation.

Uncertainties

There is uncertainty regarding the benefits from avoided water supply costs. The analysis is based on existing population and historic hydrology. Unforeseen regulation and changes in historical hydrology due to global climate change and an increasing population are factors that may significantly increase benefits.

If multiple significant leaks are found in areas subject to a CRO, and require the presence of a National Register Qualified Archaeologist, the cost of implementation could increase from the original estimate.

Table 11-1, Annual Cost of Project
(Costs in 2009 Dollars)
Project 1: City of Lompoc, Lompoc Valley Leak Detection and Repair Project

	Initial Costs	Operations and Maintenance Costs [1]						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
YEAR	Grand Total Cost From Table 7 (row (i), column(d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a) +…+ (f)	Discount Factor	Discounted Costs (g) x (h)
2009	$0	$0	$0	$0	$0	$0	$0	1.000	$0
2010	$0	$0	$0	$0	$0	$0	$0	0.943	$0
2011	$381,336	$0	$0	$0	$0	$0	$381,336	0.890	$339,389
2012	$67,295	$0	$0	$0	$0	$0	$67,295	0.840	$56,527
2013	$0	$4,325	$5,675	$15,000	$0	$0	$25,000	0.792	$19,800
2014	$0	$4,325	$5,676	$15,000	$0	$0	$25,001	0.747	$18,676
2015	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.705	$12,214
2016	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.665	$11,521
2017	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.627	$10,863
2018	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.592	$10,256
2019	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.558	$9,667
2020	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.527	$9,130
2021	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.497	$8,611
2022	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.469	$8,125
2023	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.442	$7,658
2024	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.417	$7,225
2025	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.394	$6,826
2026	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.371	$6,428
2027	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.350	$6,064
2028	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.331	$5,735
2029	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.312	$5,405
2030	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.294	$5,094
2031	$0	$4,325	$3,000	$10,000	$75,000	$0	$92,325	0.278	$25,666
2032	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.262	$4,539
2033	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.247	$4,279
2034	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.233	$4,037
2035	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.220	$3,812
2036	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.207	$3,586
2037	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.196	$3,396
2038	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.185	$3,205
2039	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.174	$3,015
2040	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.164	$2,841
2041	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.155	$2,685
2042	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.146	$2,529
2043	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.138	$2,391
2044	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.130	$2,252
2045	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.123	$2,131
2046	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.116	$2,010
2047	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.109	$1,888
2048	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.103	$1,784
2049	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.097	$1,681
2050	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.092	$1,594
2051	$0	$4,325	$3,000	$10,000	$75,000	$0	$92,325	0.087	$8,032
2052	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.082	$1,421
2053	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.077	$1,334
2054	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.073	$1,265
2055	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.069	$1,195
2056	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.065	$1,126
2057	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.061	$1,057
2058	$0	$4,325	$3,000	$10,000	$0	$0	$17,325	0.058	$1,005
							Total Present Value of Discounted Costs (Sum of Column (i))		**$660,970**
							Transfer to Table 20, column (c), Exhibit F: Proposal Costs and Benefits Summaries		
Comments: The expected useful life of the project is over the entire period of analysis, 48 years.									

(1) The incremental change in O&M costs attributable to the project.

Table 13-1, Annual Costs of Avoided Projects
(Avoided costs in 2009 dollars)
Project 1: City of Lompoc, Lompoc Valley Leak Detection and Repair Project

	Costs				Discounting Calculations	
(a)	(b)	(c)	(d)	(e)	(f)	(g)
YEAR	Alternative (Avoided Project Name): Avoided water supply costs *Avoided Project Description: Avoided annual groundwater pumping (43 AF * $879 + 57 AF * $218 + 113 AF * $331)*				Discount Factor	Discounted Costs (e) x (f)
	Avoided Capital Costs	Avoided Replacement Costs	Avoided Operations and Maintenance Costs	Total Cost Avoided for Individual Alternatives (b) + (c) + (d)		
2009	$0	$0	$0	$0	1.000	$0
2010	$0	$0	$0	$0	0.943	$0
2011	$0	$0	$0	$0	0.890	$0
2012	$0	$0	$0	$0	0.840	$0
2013	$0	$0	$87,626	$87,626	0.792	$69,400
2014	$0	$0	$87,626	$87,626	0.747	$65,457
2015	$0	$0	$87,626	$87,626	0.705	$61,776
2016	$0	$0	$87,626	$87,626	0.665	$58,271
2017	$0	$0	$87,626	$87,626	0.627	$54,942
2018	$0	$0	$87,626	$87,626	0.592	$51,875
2019	$0	$0	$87,626	$87,626	0.558	$48,895
2020	$0	$0	$87,626	$87,626	0.527	$46,179
2021	$0	$0	$87,626	$87,626	0.497	$43,550
2022	$0	$0	$87,626	$87,626	0.469	$41,097
2023	$0	$0	$87,626	$87,626	0.442	$38,731
2024	$0	$0	$87,626	$87,626	0.417	$36,540
2025	$0	$0	$87,626	$87,626	0.394	$34,525
2026	$0	$0	$87,626	$87,626	0.371	$32,509
2027	$0	$0	$87,626	$87,626	0.350	$30,669
2028	$0	$0	$87,626	$87,626	0.331	$29,004
2029	$0	$0	$87,626	$87,626	0.312	$27,339
2030	$0	$0	$87,626	$87,626	0.294	$25,762
2031	$0	$0	$87,626	$87,626	0.278	$24,360
2032	$0	$0	$87,626	$87,626	0.262	$22,958
2033	$0	$0	$87,626	$87,626	0.247	$21,644
2034	$0	$0	$87,626	$87,626	0.233	$20,417
2035	$0	$0	$87,626	$87,626	0.220	$19,278
2036	$0	$0	$87,626	$87,626	0.207	$18,139
2037	$0	$0	$87,626	$87,626	0.196	$17,175
2038	$0	$0	$87,626	$87,626	0.185	$16,211
2039	$0	$0	$87,626	$87,626	0.174	$15,247
2040	$0	$0	$87,626	$87,626	0.164	$14,371
2041	$0	$0	$87,626	$87,626	0.155	$13,582
2042	$0	$0	$87,626	$87,626	0.146	$12,793
2043	$0	$0	$87,626	$87,626	0.138	$12,092
2044	$0	$0	$87,626	$87,626	0.130	$11,391
2045	$0	$0	$87,626	$87,626	0.123	$10,778
2046	$0	$0	$87,626	$87,626	0.116	$10,165
2047	$0	$0	$87,626	$87,626	0.109	$9,551
2048	$0	$0	$87,626	$87,626	0.103	$9,025
2049	$0	$0	$87,626	$87,626	0.097	$8,500
2050	$0	$0	$87,626	$87,626	0.092	$8,062
2051	$0	$0	$87,626	$87,626	0.087	$7,623
2052	$0	$0	$87,626	$87,626	0.082	$7,185
2053	$0	$0	$87,626	$87,626	0.077	$6,747
2054	$0	$0	$87,626	$87,626	0.073	$6,397
2055	$0	$0	$87,626	$87,626	0.069	$6,046
2056	$0	$0	$87,626	$87,626	0.065	$5,696
2057	$0	$0	$87,626	$87,626	0.061	$5,345
2058	$0	$0	$87,626	$87,626	0.058	$5,082
					Total Present Value of Discounted Costs (Sum of Column (g))	$1,142,380
					(%) Avoided Cost Claimed by Project	**100%**
					Total Present Value of Discounted Avoided Project Costs Claimed by alternative (Total Present Value of Discounted Costs x % Avoided Cost Claimed by Project)	**$1,142,380**
Comments: The expected useful life of the project is over the entire period of analysis, 48 years.						

PROJECT 2:

City of Santa Maria, Untreated Water Landscape Irrigation Project

Project 2: City of Santa Maria, Untreated Water Landscape Irrigation Project

The Project will extend an existing groundwater landscape irrigation system from the City's Civic Center area to 122 acres of the landscaped areas of local public facilities. These areas include Allan Hancock College and Miller Elementary School. Future phases, not included in the Project, will extend the system to Santa Maria High School, Santa Maria Fairpark, and Adam Park. The City of Santa Maria (City) is located at the northern end of the region.

The Project will replace the use of imported potable water on landscaping with groundwater that is not suitable for drinking due to high nitrate levels. The benefits of this Project include using water more efficiently, improving water quality in the Santa Maria Groundwater Basin, and managing the City's water supply more efficiently. This efficient match of water resources to water usage will augment drought preparedness efforts within the region.

The Project will enable the City to improve water quality standards without additional state water project (SWP) supplies. As a result, this will avoid water supply purchases, improve water quality for the City's service area, and lead to higher quality wastewater treatment plant outflow, which will further improve the health of the groundwater basin. This will not only benefit the City of Santa Maria, but also the City of Guadalupe, which is heavily reliant on basin groundwater; both are disadvantaged communities. In addition, this Project ensures high-quality water supply for the neighboring region of Nipomo, as mandated in the Santa Maria Groundwater Litigation Lead Case No. CV 770214. The region of Nipomo is mandated to purchase a minimum of 2,500 AF of supplemental water annually from the City to protect and sustain regional water supplies within the San Luis Obispo County Nipomo Mesa Management Area. Meeting water supply efficiency and reliability in the southern part of the county is a priority identified in the Santa Barbara County IRWM Plan.

The benefits associated with the Project are summarized in Exhibit 7.2-1. A comparison of the costs and benefits is provided in Exhibit 7.2-2.

Costs

The well rehabilitation costs and construction of the distribution system will total $940,870. These costs will be incurred over 2 years, starting in 2011. Annual operation and maintenance costs will begin in full in 2013, totaling $11,200 for pump operation and $5,000 for minor pump maintenance. Every 10 years, pump replacement costs will be $60,000. The total present value of costs for the Project over its useful life is $1,042,416 (Table 11-2).

EXHIBIT 7.2-1
Project 2 Benefit Overview

Type of Benefit	Assessment	Beneficiaries
Water Supply Benefits		
Avoided water supply costs	Monetized	Local
Avoided water treatment costs	Monetized	Local
Avoided groundwater pumping	Monetized	Local
Water Quality and Other Expected Benefits (Attachment 8)		
M&I water quality benefits	Monetized	Local
Improved groundwater quality	Qualitative	Local
Avoided landscaping costs	Monetized	Local

Notes:
M&I = Municipal and Industrial

EXHIBIT 7.2-2
Project 2 Benefit and Cost Summary

Type of Benefit/Costs	Present Value
Capital and O&M Costs	$1,042,416
Quantitative Benefits	
Avoided water supply costs	$269,509
Avoided water treatment costs	$46,228
Avoided groundwater pumping	$138,684
M&I water quality benefits	$979,061
Avoided landscaping costs	$956
Qualitative Benefits	**Qualitative Indicator**
Improved groundwater quality	+

Notes:
+ indicates net benefits are likely to increase with Project++ indicates net benefits are likely to increase significantly with Project
O&M = operations and maintenance

Water Supply Benefits

Avoided Water Supply Costs

Without the Project, the City would continue to rely on a combination of SWP water from the Central Coast Water Authority (CCWA) via the Coastal Aqueduct and groundwater supply from the Santa Maria Valley Groundwater Basin. The total average available supply is 49,710 AFY through 2030 with service area demand increasing from 19,129 AF in 2010 to 24,780 AF in 2030 (Appendix 7-2, City of Santa Maria Urban Water Management Plan).

With the Project, the City will produce 160 AFY for landscape irrigation. The City will also reduce its demand on SWP supplies in years when Table A allocations are less than

50 percent. When SWP deliveries fall below 50 percent, the City purchases water from other CCWA project participants or state water contractors to meet water quality requirements. These water quality requirements are based on historic SWP and groundwater quality (Appendix 7-2, City of Santa Maria Urban Water Management Plan).

According to the Department of Water Resources *SWP Delivery Reliability Report 2009* (Appendix 7-2), on average, Table A allocations fall below 50 percent 22 percent of the time. With the Project, when SWP allocations are below 50 percent, the City will avoid the purchase of 80 AF from the SWP, or half of the 160 AFY yield of the Project. Essentially, the City could pump groundwater, up to an additional 80 AF, instead of purchasing SWP water and still meet water quality standards.

The average cost of groundwater pumping in the region is $75 per AF. According to the City, the average cost of purchased water in years when allocations fall below 50 percent is approximately $1,400 per AF.

Over the useful life of the Project, the average annual avoided water supply purchase from the SWP is estimated to be 17.6 AF, which is 80 AF of avoided SWP purchases multiplied by the annual probability of SWP deliveries falling below 50 percent. The net benefit equals the avoided SWP costs ($1,400 per AF) minus the pumping costs ($75 per AF) of the water used to replace the SWP supplies. Including the avoided annual pumping cost of 160 AFY, the present value of the avoided cost of water supply over the life of the Project is $408,193 (Table 13-2).

Avoided Water Treatment Costs

Without the Project, the City of Santa Maria would continue to rely on a combination of SWP and groundwater supplies. With the Project, the City of Santa Maria will reduce its water treatment costs, because 160 AF of current system demand will be applied directly to landscape irrigation, bypassing the water treatment plant. When 160 AFY is not treated with chemicals at the blending station, the savings total $4,000 (160 AF * $25 per AF in treatment costs). The present value of the avoided cost of water treatment over the life of the Project is $46,228 (Table 13-2).

Distribution of Benefits and Identification of Beneficiaries

The City provides water supply and wastewater treatment services to the City of Santa Maria and neighboring areas. The avoided water supply and water treatment costs would be a benefit to the City service area and rate payers.

Benefits Timeline

The estimated life of the Project is 32 years. Annual operation, maintenance, and repair costs, along with the benefits of the Project, begin in full in year 2013, after 2 years of Project construction beginning in 2011.

Potential Adverse Effects

Temporary impacts as a result of construction of Project 2 will be mitigated. However, with most pipeline and wellhead projects, no significant impacts are expected. The new system will use existing wells, and the distribution system will run adjacent to existing conveyance facilities. No long-term adverse impacts are expected as a result of the Project.

Summary of Findings

The majority of water supply benefits of Project 2 will be from avoided water supply and treatment costs and improved water quality conditions. The City of Santa Maria will avoid approximately $408,193 in water supply costs and $46,228 in wastewater treatment costs over the life of the Project.

Uncertainties

There is uncertainty regarding the benefits of avoided SWP supply costs. Current shortage estimates are based on existing population and historic hydrology. Unforeseen regulation and changes in historical hydrology due to global climate change are factors that may significantly increase the benefits. For example, additional SWP pumping restrictions in the Delta or reoperation of the SWP system due to regulatory or infrastructure changes would affect the future price of SWP supplies, as well as the probability of SWP allocations falling below 50 percent.

Table 11-2, Annual Cost of Project
(Costs in 2009 Dollars)
Project 2: City of Santa Maria, Untreated Water Landscape Irrigation Project

	Initial Costs	Operations and Maintenance Costs [1]						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
YEAR	Grand Total Cost From Table 7 (row (i), column(d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a) +…+ (f)	Discount Factor	Discounted Costs (g) x (h)
2009	$0	$0	$0	$0	$0	$0	$0	1.000	$0
2010	$0	$0	$0	$0	$0	$0	$0	0.943	$0
2011	$470,435	$0	$0	$0	$0	$0	$470,435	0.890	$418,687
2012	$470,435	$0	$0	$0	$0	$0	$470,435	0.840	$395,165
2013	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.792	$12,830
2014	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.747	$12,101
2015	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.705	$11,421
2016	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.665	$10,773
2017	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.627	$10,157
2018	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.592	$9,590
2019	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.558	$9,040
2020	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.527	$8,537
2021	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.497	$8,051
2022	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.469	$7,598
2023	$0	$0	$11,200	$5,000	$60,000	$0	$76,200	0.442	$33,680
2024	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.417	$6,755
2025	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.394	$6,383
2026	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.371	$6,010
2027	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.350	$5,670
2028	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.331	$5,362
2029	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.312	$5,054
2030	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.294	$4,763
2031	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.278	$4,504
2032	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.262	$4,244
2033	$0	$0	$11,200	$5,000	$60,000	$0	$76,200	0.247	$18,821
2034	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.233	$3,775
2035	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.220	$3,564
2036	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.207	$3,353
2037	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.196	$3,175
2038	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.185	$2,997
2039	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.174	$2,819
2040	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.164	$2,657
2041	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.155	$2,511
2042	$0	$0	$11,200	$5,000	$0	$0	$16,200	0.146	$2,365
							Total Present Value of Discounted Costs (Sum of Column (i))		**$1,042,416**
							Transfer to Table 20, column (c), Exhibit F: Proposal Costs and Benefits Summaries		
Comments: The expected useful life of the project is 32 years.									

(1) The incremental change in O&M costs attributable to the project.

Table 13-2, Annual Costs of Avoided Projects
(Avoided costs in 2009 dollars)
Project 2: City of Santa Maria, Untreated Water Landscape Irrigation Project

	Costs				Discounting Calculations	
(a)	(b)	(c)	(d)	(e)	(f)	(g)
YEAR	Alternative (Avoided Project Name): Avoided water supply and treatment costs. *Avoided Project Description: Avoided annual SWP purchases of 17.6 AF and 160 AF of avoided groundwater pumping (17.6 AF * $1,325/AF + 160 AF * $75/AF) along with 160 AF of avoided treatment at $25/AF*				Discount Factor	Discounted Costs (e) x (f)
	Avoided Capital Costs	Avoided Replacement Costs	Avoided Operations and Maintenance Costs	Total Cost Avoided for Individual Alternatives (b) + (c) + (d)		
2009	$0	$0	$0	$0	1.000	$0
2010	$0	$0	$0	$0	0.943	$0
2011	$0	$0	$0	$0	0.890	$0
2012	$0	$0	$0	$0	0.840	$0
2013	$0	$35,320	$4,000	$39,320	0.792	$31,141
2014	$0	$35,320	$4,000	$39,320	0.747	$29,372
2015	$0	$35,320	$4,000	$39,320	0.705	$27,721
2016	$0	$35,320	$4,000	$39,320	0.665	$26,148
2017	$0	$35,320	$4,000	$39,320	0.627	$24,654
2018	$0	$35,320	$4,000	$39,320	0.592	$23,277
2019	$0	$35,320	$4,000	$39,320	0.558	$21,941
2020	$0	$35,320	$4,000	$39,320	0.527	$20,722
2021	$0	$35,320	$4,000	$39,320	0.497	$19,542
2022	$0	$35,320	$4,000	$39,320	0.469	$18,441
2023	$0	$35,320	$4,000	$39,320	0.442	$17,379
2024	$0	$35,320	$4,000	$39,320	0.417	$16,396
2025	$0	$35,320	$4,000	$39,320	0.394	$15,492
2026	$0	$35,320	$4,000	$39,320	0.371	$14,588
2027	$0	$35,320	$4,000	$39,320	0.350	$13,762
2028	$0	$35,320	$4,000	$39,320	0.331	$13,015
2029	$0	$35,320	$4,000	$39,320	0.312	$12,268
2030	$0	$35,320	$4,000	$39,320	0.294	$11,560
2031	$0	$35,320	$4,000	$39,320	0.278	$10,931
2032	$0	$35,320	$4,000	$39,320	0.262	$10,302
2033	$0	$35,320	$4,000	$39,320	0.247	$9,712
2034	$0	$35,320	$4,000	$39,320	0.233	$9,162
2035	$0	$35,320	$4,000	$39,320	0.220	$8,650
2036	$0	$35,320	$4,000	$39,320	0.207	$8,139
2037	$0	$35,320	$4,000	$39,320	0.196	$7,707
2038	$0	$35,320	$4,000	$39,320	0.185	$7,274
2039	$0	$35,320	$4,000	$39,320	0.174	$6,842
2040	$0	$35,320	$4,000	$39,320	0.164	$6,448
2041	$0	$35,320	$4,000	$39,320	0.155	$6,095
2042	$0	$35,320	$4,000	$39,320	0.146	$5,741
				Total Present Value of Discounted Costs (Sum of Column (g))		$454,421
				(%) Avoided Cost Claimed by Project		**100%**
				Total Present Value of Discounted Avoided Project Costs Claimed by alternative (Total Present Value of Discounted Costs x % Avoided Cost Claimed by Project)		**$454,421**
Comments: The expected useful life of the project is 32 years.						

PROJECT 3:

City of Santa Maria, LeakWatch Project

Project 3: City of Santa Maria, LeakWatch Project

The City of Santa Maria is implementing the LeakWatch Project (Project 3 or Project), a water metering system enabling the City to collect and evaluate water use data on a near-real-time basis. Presently, existing meters are only read on a monthly basis, and problems such as water loss due to leaks are difficult to detect, hence customers are unable to respond and conserve water without timely information. With the Project, real-time data will be broken down to show usage by hour; this data may indicate significant use or a water leak if there is water use at all hours of the day.

The system includes base stations, converted water meter registers, transmitters, and associated software. The data provided by the fixed-base system will be used to detect leaks and assist customers to make expeditious and judicious decisions regarding water usage, especially regarding landscape irrigation. Approximately 4,720meters will be converted through in-place modification to enable the meters to send data to the base stations. This will allow almost immediate notification by the City if an end-user's patterns change significantly. It is estimated that this phase of installation will conserve up to 210 AFY of the domestic water supply. The program will also assist with water shortage contingency planning, allowing the City to track hourly water usage to assure that customers are abiding by restrictions on water use or schedules. Through reduced water use (effectively conservation), the Project will allow the City to avoid purchases of SWP water to meet wastewater plant effluent water quality requirements, thereby reducing pressure on the Delta and its ecosystems and saving the City and its customers' financial resources. The benefits associated with Project 3 are summarized in Exhibit 7.3-1. A comparison of the costs and benefits is provided in Exhibit 7.3-2.

EXHIBIT 7.3-1
Project 3 Benefit Overview

Type of Benefit	Assessment	Beneficiaries
Water Supply Benefits		
Avoided Water Supply Costs		
Avoided water supply purchases	Monetized	Local
Avoided groundwater pumping	Monetized	Local
Avoided water treatment costs	Monetized	Local
Increased groundwater supply	Quantitative	Local
Water Quality and Other Expected Benefits (Attachment 8)		
M&I water quality benefits	Monetized	Local
Improved groundwater quality	Qualitative	Local
Avoided staffing costs	Monetized	Local
Improved air quality	Qualitative	Local/State

EXHIBIT 7.3-2
Project 3 Benefit and Cost Summary

Type of Benefits/Costs	Present Value
Capital and O&M Costs	$1,993,716
Quantitative Benefits	
Avoided Water Supply Costs	$405,549
Avoided water treatment costs	$42,758
M&I water quality benefits	$354,818
Avoided staffing costs	$930,089
Qualitative Benefits	Qualitative Indicator
Increased groundwater supply	+
Improved groundwater quality	+
Improved air quality	+

Notes:
+ indicates net benefits are likely to increase with Project
++ indicates net benefits are likely to increase significantly with Project

Costs

The implementation cost of Project 3 will total $1,357,696. Implementation costs will be incurred over 1 year (2011). A one-time administration cost of $80,692 will be incurred in 2011, and annual operation and maintenance costs will begin in full in 2012, at $5,000 each. In years 12 and 13, transmitter replacement costs will total $750,000 and $450,000, respectively. Of the 210 AF of savings from implementation of the Project, 80 AF is estimated to come from leak repair at a rate of 8 AFY. The estimated cost of repairing leaks is $1,871 per AF (Appendix 7-3, Water Use Efficiency Comprehensive Evaluation). Therefore, the total repair costs will be $149,860. The total present value of costs for the Project over its useful life is $1,993,716 (Table 11-3).

Water Supply Benefits

Avoided Water Supply Costs

Without the Project, the City of Santa Maria would continue to rely on a combination of SWP water from CCWA via the Coastal Aqueduct, groundwater supply from the Santa Maria Valley Groundwater Basin, and other local supplies. The total average available supply is 49,710 AFY through 2030 with service area demand increasing from 19,129 AF in 2010 to 24,780 AF in 2030 (Appendix 7-2, City of Santa Maria Urban Water Management Plan).

With the Project, the City of Santa Maria will reduce its demand on SWP and local groundwater supplies through reducing water loss by 210 AFY. When Table A allocations fall below 50 percent, the City of Santa Maria purchases water from other CCWA Project participants or state water contractors to meet water quality

requirements. The water quality requirements are outlined in the City's Long-Term Water Management Plan.

According to the Department of Water Resources *SWP Delivery Reliability Report 2009* (Appendix 7-3), on average, SWP allocations fall below 50 percent 22 percent of the time. When SWP allocations are below 50 percent, with the Project the City of Santa Maria would avoid the purchase of 105 AF from the SWP, or half of the 210 AF replaced by the Project. The City of Santa Maria would avoid pumping 105 AF of groundwater during the SWP allocations below 50 percent and 210 per AF in all other years. Average groundwater pumping costs in the region are $75 per AF. According to the City, the average additional cost of purchased water is approximately $1,400 per AF.

Over the useful life of the Project the average annual avoided water supply purchase from the SWP is estimated to be 23.1 AF. This is the 105 AF of avoided SWP purchases multiplied by the probability of SWP allocations falling below 50 percent. The benefit being the avoided SWP water cost of $1,400 per AF. The avoided annual pumping would total 186.9 AFY. This is the 105 AF of avoided groundwater pumping multiplied by the probability of SWP falling below 50 percent and the 210 AF of avoided groundwater pumping multiplied by the probability of SWP deliveries exceeding 50 percent.

The full benefit of the Project won't be realized until year 10. Leak repair savings are expected to occur at a rate of 8 AFY, in the end totaling 80 AFY. Considering this, the present value of the avoided cost of water supply purchases and pumping over the life of the Project is $405,549 (Table 13-3).

Avoided Water Treatment Costs

Without the Project, the City of Santa Maria would continue to rely on a combination of SWP and groundwater supplies. With the Project, the City of Santa Maria will reduce its water treatment costs, because 210 AFY of current system demand will be reduced through leak repair and demand management. The 210 AFY not treated with chemicals at the blending station will result in a total savings of $5,250 (210 AF * $25 per AF in treatment costs). The initial amount saved will be 130 AFY with an additional 8 AFY from repairs, until 210 AFY is reached. The present value of the avoided cost of water treatment over the life of the Project is $42,758 (Table 13-3).

Increased Groundwater Supply

Project 3 will save an average of 210 AFY, and 186.9 AFY of this savings will be achieved because of avoided groundwater pumping. By foregoing groundwater extraction, the City of Santa Maria is increasing its ability to manage drought conditions in the area by ensuring groundwater supply reliability into the future. The added water supply reliability provided by the avoided groundwater pumping is uncertain; therefore, this benefit is discussed qualitatively.

Distribution of Benefits and Identification of Beneficiaries

The City provides water supply and wastewater treatment services to the City of Santa Maria and neighboring areas. The avoided water supply and wastewater treatment costs would be a benefit to the City service area.

Benefits Timeline

The estimated life of the Project is 19 years. Benefits will begin in 2012, after 1 year of Project implementation, beginning in 2011. The leak detection and repair is expected to reduce system losses by 8 AFY. Therefore, the Project will result in incremental, annual decreases in system losses, and the full benefit of the Project will be realized 10 years after implementation.

Potential Adverse Effects

Temporary impacts as a result of Project implementation will not be significant. The new metering system will be integrated into the existing system through modification or replacement of the existing system. No long-term impacts are expected from leak detection and repair, and no long-term impacts are expected as a result of the Project.

Summary of Findings

Water supply benefits of Project 3 include avoided water supply purchase and reduction in system operation and staffing costs. The City of Santa Maria will avoid approximately $448,307 in water supply costs over the life of the Project.

Uncertainties

There is uncertainty regarding the benefits of avoided water supply costs. Current shortage estimates are based on existing population and historic hydrology. Unforeseen regulation and changes in historical hydrology due to global climate change are factors that may significantly increase the benefits. For example, additional SWP pumping restrictions at the Delta or reoperation of the SWP system due to regulatory or infrastructure changes would affect the future price of SWP supplies, as well as the probability of SWP allocations falling below 50 percent.

Table 11-3, Annual Cost of Project
(Costs in 2009 Dollars)
Project 3: City of Santa Maria, LeakWatch Project

	Initial Costs	Operations and Maintenance Costs [1]						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
YEAR	Grand Total Cost From Table 7 (row (i), column(d))	Admin	Operation	Maintenance	Replacement	Other (Leak Repair)	Total Costs (a) +…+ (f)	Discount Factor	Discounted Costs (g) x (h)
2009	$0	$0	$0	$0	$0	$0	$0	1.000	$0
2010	$0	$0	$0	$0	$0	$0	$0	0.943	$0
2011	$1,357,696	$80,692	$0	$0	$0	$0	$1,438,388	0.890	$1,280,165
2012	$0	$0	$5,000	$5,000	$0	$14,968	$24,968	0.840	$20,973
2013	$0	$0	$5,000	$5,000	$0	$14,968	$24,968	0.792	$19,775
2014	$0	$0	$5,000	$5,000	$0	$14,968	$24,968	0.747	$18,651
2015	$0	$0	$5,000	$5,000	$0	$14,968	$24,968	0.705	$17,602
2016	$0	$0	$5,000	$5,000	$0	$14,968	$24,968	0.665	$16,604
2017	$0	$0	$5,000	$5,000	$0	$14,968	$24,968	0.627	$15,655
2018	$0	$0	$5,000	$5,000	$0	$14,968	$24,968	0.592	$14,781
2019	$0	$0	$5,000	$5,000	$0	$14,968	$24,968	0.558	$13,932
2020	$0	$0	$5,000	$5,000	$0	$14,968	$24,968	0.527	$13,158
2021	$0	$0	$5,000	$5,000	$0	$14,968	$24,968	0.497	$12,409
2022	$0	$0	$5,000	$5,000	$0	$0	$10,000	0.469	$4,690
2023	$0	$0	$5,000	$5,000	$750,000	$0	$760,000	0.442	$335,920
2024	$0	$0	$5,000	$5,000	$450,000	$0	$460,000	0.417	$191,820
2025	$0	$0	$5,000	$5,000	$0	$0	$10,000	0.394	$3,940
2026	$0	$0	$5,000	$5,000	$0	$0	$10,000	0.371	$3,710
2027	$0	$0	$5,000	$5,000	$0	$0	$10,000	0.350	$3,500
2028	$0	$0	$5,000	$5,000	$0	$0	$10,000	0.331	$3,310
2029	$0	$0	$5,000	$5,000	$0	$0	$10,000	0.312	$3,120
							Total Present Value of Discounted Costs (Sum of Column (i))		**$1,993,716**
							Transfer to Table 20, column (c), Exhibit F: Proposal Costs and Benefits Summaries		

Comments: The expected useful life of the Project is 19 years. **Note: Leak repair (f) occurs at a rate of 8 AF/year until 80 AF is reached (10 years).**

(1) The incremental change in OHM costs attributable to the project.

Table 13-3, Annual Costs of Avoided Projects
(Avoided costs in 2009 dollars)
Project 3: City of Santa Maria, LeakWatch Project

	Costs				Discounting Calculations	
(a)	(b)	(c)	(d)	(e)	(f)	(g)
YEAR	Alternative (Avoided Project Name): Avoided water supply costs. *Avoided Project Description: Avoided annual SWP purchases of 23.1 AF and 186.9 AF of avoided groundwater pumping (23.1 AF * $1,400/AF + 186.9 AF * $75/AF) and avoided treatment of 210 AF at $25/AF*				Discount Factor	Discounted Costs (e) x (f)
	Avoided Capital Costs	Avoided Replacement Costs	Avoided Operations and Maintenance Costs	Total Cost Avoided for Individual Alternatives (b) + (c) + (d)		
2009	$0	$0	$0	$0	1.000	$0
2010	$0	$0	$0	$0	0.943	$0
2011	$0	$0	$0	$0	0.890	$0
2012	$0	$37,528	$3,250	$40,778	0.840	$34,253
2013	$0	$32,804	$3,450	$36,254	0.792	$28,713
2014	$0	$34,570	$3,650	$38,220	0.747	$28,550
2015	$0	$36,336	$3,850	$40,186	0.705	$28,331
2016	$0	$38,102	$4,050	$42,152	0.665	$28,031
2017	$0	$39,868	$4,250	$44,118	0.627	$27,662
2018	$0	$41,634	$4,450	$46,084	0.592	$27,281
2019	$0	$43,400	$4,650	$48,050	0.558	$26,812
2020	$0	$45,166	$4,850	$50,016	0.527	$26,358
2021	$0	$46,932	$5,050	$51,982	0.497	$25,835
2022	$0	$48,698	$5,250	$53,948	0.469	$25,301
2023	$0	$48,698	$5,250	$53,948	0.442	$23,845
2024	$0	$48,698	$5,250	$53,948	0.417	$22,496
2025	$0	$48,698	$5,250	$53,948	0.394	$21,255
2026	$0	$48,698	$5,250	$53,948	0.371	$20,015
2027	$0	$48,698	$5,250	$53,948	0.350	$18,882
2028	$0	$48,698	$5,250	$53,948	0.331	$17,857
2029	$0	$48,698	$5,250	$53,948	0.312	$16,832
				Total Present Value of Discounted Costs (Sum of Column (g))		$448,307
				(%) Avoided Cost Claimed by Project		**100%**
				Total Present Value of Discounted Avoided Project Costs Claimed by alternative (Total Present Value of Discounted Costs x % Avoided Cost Claimed by Project)		**$448,307**

Comments: The expected useful life of the project is 19 years.
Note: Leak repair occurs at a rate of 8 AF/year until 80 AF is reached (10 years).

PROJECT 4:

City of Goleta, San Jose Creek Capacity Improvement and Fish Passage Project

Project 4: City of Goleta, San Jose Creek Capacity Improvement and Fish Passage Project

The San Jose Creek Capacity Improvement and Fish Passage Project (Project 4 or Project) will involve the removal and reconstruction of the San Jose Creek Flood Control Channel. When completed, this multi-objective Project will increase flood conveyance capacity, reduce flood hazard, and provide fish passage for migrating endangered steelhead trout. Project 4, a cooperative effort between the City of Goleta and Santa Barbara County Flood Control District, will remove residential, commercial, and industrial properties from the regulatory flood plain. The new channel will include an articulated concrete bottom that will allow for fish passage during low flow events, reduced water quality impacts to the Goleta Slough, and increased groundwater recharge.

The "Old Town Goleta" area has been repeatedly damaged by overflows from San Jose Creek during flooding events. Two serious events occurred in 1995 and another one in 1998, causing significant damage. This Project is needed to reduce the threat to public safety and property from flooding events. When San Jose Creek overflows its banks, the entire downtown area is affected. The flooding devastates homes and businesses, requires public resources, and carries contaminants to Goleta Slough and the Pacific Ocean. The goal of the flood control portion of this Project is to protect the "Old Town Goleta" area from flooding and associated damages.

The existing flood control channel also acts as a barrier to the migration of steelhead trout. During low-flow events, fish are unable to swim up the channel; in order to allow for fish passage, the channel must be modified. The Project will include a low-flow channel designed specifically for fish passage. Completion of this Project will remove a significant barrier to fish passage and help restore steelhead trout runs in San Jose Creek. The benefits associated with Project 4 are summarized in Exhibit 7.4-1.
A comparison of the costs and benefits is provided in Exhibit 7.4-2.

EXHIBIT 7.4-1
Project 4 Benefit Overview

Type of Benefit	Assessment	Beneficiaries
Water Supply Benefits		
Increased groundwater supply	Quantitative	Local
Water Quality and Other Expected Benefits (Attachment 8)		
Water quality	Qualitative	Local
Aesthetic	Qualitative	Local
Environmental	Qualitative	State
Flood Damage Reduction (Attachment 9)		
Avoided flood damages	Monetized	Local

EXHIBIT 7.4-2
Project 4 Benefit and Cost Summary

Type of Benefits/Costs	Present Value
Capital and O&M Costs	$22,774,512
Quantitative Benefits	
Avoided flood damages and other costs	$54,252,000
Qualitative Benefits	Qualitative Indicator
Water quality	+
Increased groundwater supply	+
Aesthetic	++
Environmental	++
Notes: + indicates net benefits are likely to increase ++ indicates net benefits are likely to increase significantly	

Costs

The construction costs for the Project will total $23,411,088. Construction costs will be incurred over 3 years, 2011 through 2013. Annual administration, operation, maintenance, and other costs will begin in full in 2014 and will be $18,000, $40,000, $100,000, $60,000, and $2,000, respectively. The total present value of costs over the useful life of the Project in 2009 dollars is $22,774,512 (Table 11-4).

Water Supply Benefits

Increased Groundwater Supply

Without the Project, San Jose Creek would continue to flow through the existing flood control channel, which is lined with concrete and prohibits any significant recharge to groundwater.

With the Project, natural groundwater recharge will occur by infiltration through the articulated concrete revetment lined channel bottom. These changes will help San Jose Creek revert to the natural conditions that existed prior to the construction of a concrete lined channel in 1964. The primary groundwater supply benefit would occur when groundwater infiltration helps prevent salt water intrusion from Goleta Slough. Maintaining groundwater quality in turn maintains groundwater supply in the immediate area, avoiding water quality issues that prevent the use of groundwater for beneficial use. With the Project, it is estimated that 8 AFY will infiltrate the groundwater basin, assisting in the prevention of poor quality water moving into the groundwater basin (Appendix 7-4, Goleta Water District Groundwater Report). City staff estimated groundwater infiltration based on surface area of the channel bottom, historical flows, and material characteristics of the channel bottom. The benefit of the additional groundwater is uncertain; therefore, the benefit is discussed qualitatively.

Distribution of Benefits and Identification of Beneficiaries

The increased groundwater supply potentially will benefit groundwater users such as agricultural operation in the immediate vicinity. Additional groundwater recharge would not only increase groundwater supply but also maintain or improve groundwater quality for the Goleta Water District.

Benefits Timeline

The estimated life of the Project is 78 years. Benefits will begin in full in year 2014, after 3 years of construction beginning in 2011.

Potential Adverse Effects

Temporary impacts as a result of Project implementation will be mitigated. The San Jose Creek capacity improvement Project will occur within the existing flood control channel and along the 7-foot-wide right-of-way purchased from California Department of Transportation (Caltrans). The land purchased from Caltrans has no independent utility; its only value is as part of Highway 217 right-of-way. Including it as part of the Flood Control Channel will have no impact on Highway 217, and no long-term impacts are expected as a result of the Project.

Summary of Findings

The increased groundwater supply as a result of Project implementation will benefit primarily agricultural users in the immediate vicinity of San Jose Creek. The primary monetized benefit of Project 4 will be the reduction in flood damage, detailed in Attachment 9.

Uncertainties

There is uncertainty regarding the benefits from additional groundwater recharge. A detailed assessment of the groundwater infiltration is not available. Therefore, the exact benefit from preventing salinity intrusion and providing additional groundwater supply is presently unknown.

Table 11-4, Annual Cost of Project
(Costs in 2009 Dollars)
Project 4: City of Goleta, San Jose Creek Capacity Improvement and Fish Passage Project

	Initial Costs	Operations and Maintenance Costs [1]						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
YEAR	Grand Total Cost From Table 7 (row (i), column(d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a) +…+ (f)	Discount Factor	Discounted Costs(g) x (h)
2009	$0	$0	$0	$0	$0	$0	$0	1.000	$0
2010	$0	$0	$0	$0	$0	$0	$0	0.943	$0
2011	$8,193,881	$0	$0	$0	$0	$0	$8,193,881	0.890	$7,292,554
2012	$11,705,544	$0	$0	$0	$0	$0	$11,705,544	0.840	$9,832,657
2013	$3,511,663	$0	$0	$0	$0	$0	$3,511,663	0.792	$2,781,237
2014	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.747	$164,340
2015	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.705	$155,100
2016	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.665	$146,300
2017	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.627	$137,940
2018	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.592	$130,240
2019	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.558	$122,760
2020	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.527	$115,940
2021	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.497	$109,340
2022	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.469	$103,180
2023	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.442	$97,240
2024	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.417	$91,740
2025	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.394	$86,680
2026	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.371	$81,620
2027	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.350	$77,000
2028	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.331	$72,820
2029	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.312	$68,640
2030	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.294	$64,680
2031	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.278	$61,160
2032	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.262	$57,640
2033	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.247	$54,340
2034	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.233	$51,260
2035	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.220	$48,400
2036	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.207	$45,540
2037	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.196	$43,120
2038	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.185	$40,700
2039	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.174	$38,280
2040	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.164	$36,080
2041	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.155	$34,100
2042	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.146	$32,120
2043	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.138	$30,360
2044	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.130	$28,600
2045	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.123	$27,060
2046	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.116	$25,520
2047	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.109	$23,980
2048	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.103	$22,660
2049	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.097	$21,340
2050	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.092	$20,240
2051	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.087	$19,140
2052	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.082	$18,040
2053	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.077	$16,940
2054	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.073	$16,060
2055	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.069	$15,180
2056	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.065	$14,300
2057	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.061	$13,420
2058	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.058	$12,660
2059	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.054	$11,943
2060	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.051	$11,267
2061	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.048	$10,630
2062	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.046	$10,028
2063	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.043	$9,460
2064	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.041	$8,925
2065	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.038	$8,420
2066	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.036	$7,943
2067	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.034	$7,493
2068	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.032	$7,069
2069	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.030	$6,669
2070	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.029	$6,292
2071	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.027	$5,936
2072	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.025	$5,600
2073	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.024	$5,283
2074	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.023	$4,984
2075	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.021	$4,701
2076	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.020	$4,435
2077	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.019	$4,184
2078	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.018	$3,947
2079	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.017	$3,724
2080	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.016	$3,513
2081	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.015	$3,314
2082	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.014	$3,127
2083	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.013	$2,950
2084	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.013	$2,783
2085	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.012	$2,625
2086	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.011	$2,477
2087	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.011	$2,336
2088	$0	$18,000	$40,000	$100,000	$60,000	$2,000	$220,000	0.010	$2,204
							Total Present Value of Discounted Costs (Sum of Column (i))		**$22,774,512**
							Transfer to Table 20, column (c), Exhibit F: Proposal Costs and Benefits Summaries		
Comments: The expected useful life of the project is over the entire period of analysis, 78 years.									

(1) The incremental change in O&M costs attributable to the project.

PROJECT 5:

Central Coast Water Authority,
Water Supply Reliability and Infrastructure Improvement Project

Project 5: Central Cost Water Authority, Water Supply Reliability and Infrastructure Improvement Project

The Central Coast Water Authority (CCWA) owns and operates a pipeline that delivers water from the Santa Ynez Pumping Plant located in the Santa Ynez Valley to Lake Cachuma. The pipeline was originally constructed in the 1960s for the purpose of delivering water from Lake Cachuma to the Santa Ynez Valley. However, CCWA acquired the pipeline in the mid-1990s to complete its water conveyance system for its south Santa Barbara County participants, which was part of the overall effort to install Phase II of the Coastal Branch of the SWP.

At two locations along this pipeline, the pipe has been exposed due to erosion of overlying soils during high flows. Pipe exposed in this manner is placed at risk of failing, because the exposed pipe has lost the structural confinement of backfill, which is an important strengthening component of the pipeline; and the exposed pipeline section will bridge and obstruct water flow, which will subject the pipeline to strong external forces arising from the impact of high water flow. The Water Supply Reliability and Infrastructure Improvement Project (Project 5 or Project) will implement both interim and long-term fixes to protect the sections of exposed pipe from further damage ensuring provision of water to South Coast purveyors and increasing reliability.

The CCWA pipeline extending from the Santa Ynez Pumping Plant to Lake Cachuma represents a critical link for delivery of state water to water purveyors in southern Santa Barbara County. A break in this pipeline would essentially interrupt all water delivery operations for an extended period of time. For these reasons and the pipeline's location within a river flood plain setting, it is important to implement both interim and long-term measures to prevent the further damage to the pipeline. The benefits associated with Project 5 are summarized in Exhibit 7.5-1. A comparison of the costs and benefits is provided in Exhibit 7.5-2.

EXHIBIT 7.5-1
Project 5 Benefit Overview

Type of Benefit	Assessment	Beneficiaries
Water Supply Benefits		
Avoided water supply costs	Monetized	Local
Increased groundwater supply	Qualitative	Local
Water Quality and Other Expected Benefits (Attachment 8)		
Groundwater quality	Qualitative	Local
Avoided repair costs	Quantitative	Local
Environmental	Qualitative	State

EXHIBIT 7.5-2
Project 5 Benefit and Cost Summary

Type of Benefits/Costs	Present Value
Capital and O&M Costs	$610,579
Quantitative Benefits	
Avoided water supply costs	$531,587
Avoided repair costs	$392,399
Qualitative Benefits	Qualitative Indicator
Groundwater quality	+
Increased groundwater supply	+
Environmental	+

Notes:
+ indicates net benefits are likely to increase
++ indicates net benefits are likely to increase significantly
O&M = operations and maintenance

Costs

Project implementation will total $752,500, with 10 percent of the Project spent in the first year, 20 percent in the second year, and 70 percent in the third year of the Project. Annual administration, operation, and maintenance costs will not increase with the Project. Since the pipeline is currently exposed in two areas, CCWA staff presently conduct inspections during and immediately following all spill events likely to impact the exposed pipe; once the exposed pipe is repaired, these inspections will continue to verify that the repair remains in place. The total present value of costs over the useful life of the Project is $610,579 (Table 11-5).

Water Supply Benefits

Avoided Water Supply Costs

Without the Project, CCWA's pipeline delivering water to Cachuma is at risk of catastrophic failure. CCWA staff has determined that spill events from Bradbury Dam exceeding 10,000 cubic feet per second (cfs) have the potential of impacting the sections of exposed pipe below the dam. A review of the historic record for spills at Bradbury Dam indicates an annual probability of approximately 20 percent for a spill with a peak flow rate of 10,000 cfs to occur in a given year. However, spill events above 20,000 cfs have historically occurred more than once every 10 years (Appendix 7-5, Bradbury Reservoir Operations).

It is expected that the exposed pipeline in the riverbed will eventually break as a result of mechanical stress caused by water flow. CCWA staff has documented the break of one section of abandoned pipeline that was exposed to water flow within the riverbed. In addition, a catastrophic break of the pipeline near the Bradbury Dam occurred during the historic high-flow spill event of 1969. It is also important to point out that

when a pipeline is exposed and subjected to traverse loading from water flows, less than catastrophic damage to the pipeline can occur. The stress from the water can cause flexure of the pipe that may potentially cause delamination of the mortar lining and coating of the pipe. This would eliminate the cathodic protection provided by the mortar lining and coating, and corrosion would proceed, ultimately creating a leak.

Based on this information and historical spill events, the probability of a spill event over 10,000 cfs is estimated to be 20 percent, and a spill event over 20,000 cfs is estimated to be 10 percent. It is anticipated that there is a 50 percent probability of pipeline failure during a 10,000 cfs event, and events over 20,000 cfs would cause the pipeline to fail.

If pipeline failure occurs, SWP losses during the failure count toward South County Water Agencies (SCWA) allocations and they would receive reduced future deliveries. Pipeline failure would also affect upstream agencies. Water in the system would have to be held above the break until repairs were complete. This would result in nitrification and after approximately 40 days, the water being held would not suitable for potable use. Therefore, with the Project, potential loss of supply due to pipeline failure would be reduced.

Given restrictions on construction in the Santa Ynez watershed, if pipeline failure were to occur between January and April, the earliest the pipeline could be repaired and become operational would be mid-June. Therefore, the loss of CCWA water would have a profound effect on the SCWA from the time the spill stops until mid-June. Using the midpoint from January 1 to May 1, and including the 6 weeks of downtime until the pipeline is repaired in mid-June, the water that would be lost is estimated to be 3,014.5 AF. This assumes continuous delivery of 62 percent of SWP allocations to the CCWA.

For upstream agencies, using the midpoint from January 1 to May 1, the expected loss of supply to nitrification total 835 AF. This assumes continuous delivery of 62 percent of SWP allocations to the CCWA and that 6 weeks of downtime for repair is the period it would take until the held water supply becomes unsuitable for potable use.

An interruption in deliveries would require the SCWA and upstream agencies to use groundwater as an alternative source until SWP deliveries are reinstated. According to CCWA, typical planning costs in the region attribute $200 and $250 per AF for SCWA and upstream agencies, respectively, for groundwater supply sources. Given the weighted average variable cost of water ($178.13), annual avoided water supply costs from switching to groundwater pumping during a pipeline failure are expected to total $125,939 [($200-$178.13)*3,014.5AF+($250-$178.13)*835AF]. The present value of the expected avoided water supply costs ($47,227), given the previously mentioned probability of high flow events and pipeline failure, over the life of the Project is $531,587 (Table 13-5).

Increased Groundwater Supply

Without the Project, there is a relatively high probability that at within the next 40 years, the SCWA would need to pump groundwater to replace foregone deliveries from CCWA during repairs to the pipeline that delivers water to Cachuma. With the Project, pumping of 3,849.5 AF (3014.5 AF + 835 AF) of groundwater will be avoided, and the SCWA and upstream agencies will improve the reliability of local supply for drought conditions. The added water supply reliability provided by the avoided groundwater pumping is uncertain; therefore, this benefit is discussed qualitatively.

Distribution of Benefits and Identification of Beneficiaries

The avoided groundwater pumping costs will benefit the service area of the SCWA. Also, with the Project, additional groundwater will be available during drought conditions.

Benefits Timeline

The estimated life of the Project is 30 years. Benefits will begin in full in year 2014, after 3 years of Project construction beginning in 2011.

Potential Adverse Effects

Temporary impacts as a result of Project implementation will be mitigated. The Project will cause minor disturbances that will be mitigated, and no long-term impacts are expected as a result of the Project.

Summary of Findings

The primary benefits of Project 5 are from avoided groundwater pumping costs. The South County Water Agencies and upstream agencies will avoid approximately $531,587 in costs over the life of the Project, which would not occur without Project implementation.

Uncertainties

There is uncertainty regarding the probability that the pipeline will fail with a spill event. Climate change could impact the frequency and significance of flood events. The current estimate of pipeline failure is based on available information and does not incorporate the impacts of a change in historic hydrology.

Table 11-5, Annual Cost of Project
(Costs in 2009 Dollars)
Project 5: Central Coast Water Authority, Water Supply Reliability and Infrastructure Improvement Project

	Initial Costs	Operations and Maintenance Costs [1]						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
YEAR	Grand Total Cost From Table 7 (row (i), column(d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a) +…+ (f)	Discount Factor	Discounted Costs (g) x (h)
2009	$0	$0	$0	$0	$0	$0	$0	1.000	$0
2010	$0	$0	$0	$0	$0	$0	$0	0.943	$0
2011	$75,250	$0	$0	$0	$0	$0	$75,250	0.890	$66,973
2012	$150,500	$0	$0	$0	$0	$0	$150,500	0.840	$126,420
2013	$526,750	$0	$0	$0	$0	$0	$526,750	0.792	$417,186
2014	$0	$0	$0	$0	$0	$0	$0	0.747	$0
2015	$0	$0	$0	$0	$0	$0	$0	0.705	$0
2016	$0	$0	$0	$0	$0	$0	$0	0.665	$0
2017	$0	$0	$0	$0	$0	$0	$0	0.627	$0
2018	$0	$0	$0	$0	$0	$0	$0	0.592	$0
2019	$0	$0	$0	$0	$0	$0	$0	0.558	$0
2020	$0	$0	$0	$0	$0	$0	$0	0.527	$0
2021	$0	$0	$0	$0	$0	$0	$0	0.497	$0
2022	$0	$0	$0	$0	$0	$0	$0	0.469	$0
2023	$0	$0	$0	$0	$0	$0	$0	0.442	$0
2024	$0	$0	$0	$0	$0	$0	$0	0.417	$0
2025	$0	$0	$0	$0	$0	$0	$0	0.394	$0
2026	$0	$0	$0	$0	$0	$0	$0	0.371	$0
2027	$0	$0	$0	$0	$0	$0	$0	0.350	$0
2028	$0	$0	$0	$0	$0	$0	$0	0.331	$0
2029	$0	$0	$0	$0	$0	$0	$0	0.312	$0
2030	$0	$0	$0	$0	$0	$0	$0	0.294	$0
2031	$0	$0	$0	$0	$0	$0	$0	0.278	$0
2032	$0	$0	$0	$0	$0	$0	$0	0.262	$0
2033	$0	$0	$0	$0	$0	$0	$0	0.247	$0
2034	$0	$0	$0	$0	$0	$0	$0	0.233	$0
2035	$0	$0	$0	$0	$0	$0	$0	0.220	$0
2036	$0	$0	$0	$0	$0	$0	$0	0.207	$0
2037	$0	$0	$0	$0	$0	$0	$0	0.196	$0
2038	$0	$0	$0	$0	$0	$0	$0	0.185	$0
2039	$0	$0	$0	$0	$0	$0	$0	0.174	$0
2040	$0	$0	$0	$0	$0	$0	$0	0.164	$0
							Total Present Value of Discounted Costs (Sum of Column (i))		**$610,579**
							Transfer to Table 20, column (c), Exhibit F: Proposal Costs and Benefits Summaries		
Comments: The estimated useful life of the project is 30 years.									

(1) The incremental change in O&M costs attributable to the project.

Table 13-5, Annual Costs of Avoided Projects
(Avoided costs in 2009 dollars)

Project 5: Central Coast Water Authority, Water Supply Reliability and Infrastructure Improvement Project

	Costs				Discounting Calculations	
(a)	(b)	(c)	(d)	(e)	(f)	(g)
YEAR	Alternative (Avoided Project Name): Avoided water supply costs. *Avoided Project Description: Expected avoided annual avoided groundwater pumping* Avoided Capital Costs	Expected Avoided Replacement Costs	Avoided Operations and Maintenance Costs	Total Cost Avoided for Individual Alternatives (b) + (c) + (d)	Discount Factor	Discounted Costs (e) x (f)
2009	$0	$0	$0	$0	1.000	$0
2010	$0	$0	$0	$0	0.943	$0
2011	$0	$0	$0	$0	0.890	$0
2012	$0	$0	$0	$0	0.840	$0
2013	$0	$47,227	$0	$47,227	0.792	$37,404
2014	$0	$47,227	$0	$47,227	0.747	$35,279
2015	$0	$47,227	$0	$47,227	0.705	$33,295
2016	$0	$47,227	$0	$47,227	0.665	$31,406
2017	$0	$47,227	$0	$47,227	0.627	$29,611
2018	$0	$47,227	$0	$47,227	0.592	$27,958
2019	$0	$47,227	$0	$47,227	0.558	$26,353
2020	$0	$47,227	$0	$47,227	0.527	$24,889
2021	$0	$47,227	$0	$47,227	0.497	$23,472
2022	$0	$47,227	$0	$47,227	0.469	$22,149
2023	$0	$47,227	$0	$47,227	0.442	$20,874
2024	$0	$47,227	$0	$47,227	0.417	$19,694
2025	$0	$47,227	$0	$47,227	0.394	$18,607
2026	$0	$47,227	$0	$47,227	0.371	$17,521
2027	$0	$47,227	$0	$47,227	0.350	$16,529
2028	$0	$47,227	$0	$47,227	0.331	$15,632
2029	$0	$47,227	$0	$47,227	0.312	$14,735
2030	$0	$47,227	$0	$47,227	0.294	$13,885
2031	$0	$47,227	$0	$47,227	0.278	$13,129
2032	$0	$47,227	$0	$47,227	0.262	$12,373
2033	$0	$47,227	$0	$47,227	0.247	$11,665
2034	$0	$47,227	$0	$47,227	0.233	$11,004
2035	$0	$47,227	$0	$47,227	0.220	$10,390
2036	$0	$47,227	$0	$47,227	0.207	$9,776
2037	$0	$47,227	$0	$47,227	0.196	$9,256
2038	$0	$47,227	$0	$47,227	0.185	$8,737
2039	$0	$47,227	$0	$47,227	0.174	$8,217
2040	$0	$47,227	$0	$47,227	0.164	$7,745
Total Present Value of Discounted Costs (Sum of Column (g))						$531,587
(%) Avoided Cost Claimed by Project						**100%**
Total Present Value of Discounted Avoided Project Costs Claimed by alternative (Total Present Value of Discounted Costs x % Avoided Cost Claimed by Project)						**$531,587**
Comments: The estimated useful life of the project is 30 years.						

PROJECT 6:

Goleta Sanitary District, Wastewater Treatment Plant Upgrade

Project 6: Goleta Sanitary District, Wastewater Treatment Plant Upgrade

The Goleta Sanitary District (GSD) Wastewater Treatment Plant Upgrade (Project 6 or Project) makes it possible for the existing wastewater treatment facilities to treat 100 percent of the wastewater from the Goleta Valley to full secondary treatment level. The current facilities, with a design capacity of 9 million gallons per day (mgd), can treat 100 percent of the flow to the primary level, but only 4.38 mgd can be treated to secondary standards. This Project will increase the current capacity of the secondary treatment structures without increasing the overall capacity of the treatment plant.

Specifically, new construction will include: (1) a new biofilter; (2) an aeration basin; (3) two new secondary sedimentation tanks; and (4) a new solids handling building. Modification of existing structures and equipment will include: (1) the conversion of an existing stabilization basin into a flow equalization basin; (2) updating emergency generators; (2) replacing a diesel operated sludge dredge with an electric sludge dredge; and (4) replacing an existing waste gas flare with a new cleaner burning model.

The existing treatment plant discharges the primary and secondary wastewater blend into the Pacific Ocean under a Clean Water Act 301(h) waiver from full secondary standards. GSD applied for a renewal of the 301(h) waiver discharge permit in 2001, and through the permit renewal process, GSD agreed with the Regional Water Quality Control Board (RWQCB) to upgrade the facilities under terms and conditions set forth in a settlement agreement to meet full secondary treatment levels by November 2014. In conjunction with the upgrade of the liquid treatment process, the Project also will include the replacement of outdated and aged equipment with new equipment that meets current air quality regulatory requirements by using cleaner energy technologies, thus the Project will reduce its carbon footprint thereby ameliorating negative impacts on climate change. The benefits associated with the Project are summarized in Exhibit 7.6-1. A comparison of the costs and benefits is provided in Exhibit 7.6-2.

EXHIBIT 7.6-1
Project 6 Benefit Overview

Type of Benefit	Assessment	Beneficiaries
Water Supply Benefits		
Water supply sales	Quantitative	Local/State
Water Quality and Other Expected Benefits (Attachment 8)		
Wastewater quality	Qualitative	Local/State
Avoided operations costs	Monetized	Local
Avoided water quality fines	Monetized	Local
Air quality	Qualitative	Local
Carbon emissions	Qualitative	Local State

EXHIBIT 7.6-2
Project 6 Benefit and Cost Summary

Type of Benefits/Costs	Present Value
Capital and O&M Costs	$33,246,829
Quantitative Benefits	
Avoided operations costs	$3,876,767
Avoided water quality fines	$881,640
Qualitative Benefits	Qualitative Indicator
Water supply reliability	++
Wastewater quality	++
Air quality	+
Carbon emissions	+
Notes: + indicates net benefits are likely to increase ++ indicates net benefits are likely to increase significantly	

Costs

The construction costs for the wastewater treatment plant upgrade Project will total $30,675,670 over a 3-year period beginning in 2011. Sixteen percent of the costs are expected to be incurred in the first year, 68 percent in the second, and the final 16 percent in the third. Additional annual operation and maintenance costs will begin in full in 2014, totaling $610,000. The total present value of costs for the Project over its useful life is $33,246,829 (Table 11-6).

Water Supply Benefits

The Project will directly benefit the City of Goleta by providing a reliable source of recycled water to the Goleta Water District (GWD). Currently, GSD supplies GWD with a source of recycled water; however, the quantity of recycled water is unreliable, given at times GSD needs the water to meet effluent discharge standards. Upon realization of this Project, GSD would be able to meet effluent discharge standards and therefore supply GWD with a reliable amount of recycled water for landscape irrigation use, effectively offsetting potable water use for such applications. Although water supply benefits are probable, the benefits of selling a portion of GWD's supply (e.g., SWP) in-lieu of reliable recycled water is speculative at this time; therefore, the benefits of the project are discussed qualitatively.

Distribution of Benefits and Identification of Beneficiaries

The GWD service area (which includes "Old Town Goleta") could benefit by reducing the overall water supply costs for irrigation purposes by utilizing recycled water in place of more costly SWP water. Beneficiaries could also include other SWP contractors as water supply is reallocated in the region due to the reliable recycled water from GSD.

Benefits Timeline

The estimated life of the Project is 48 years. Benefits will begin in 2014, after 3 years of Project construction beginning in 2011.

Potential Adverse Effects

Temporary impacts may occur as a result of replacement and expansion of existing facilities; these effects will be mitigated. No adverse long-term impacts are expected as a result of updating the existing wastewater treatment plant. The recycled water distribution system is already in operation.

Summary of Findings

The water supply benefits of Project 6 are from the increased reliability of recycled water delivered to GWD .

Uncertainties

There is uncertainty regarding the quantity of recycled water that is needed by GWD in the future for replacement of potable water currently used for irrigation purposes. GWD is preparing a Water Supply Management Plan, which is likely to be completed between March and July 2011, and the District will also be submitting a 2010 UWMP to DWR in July 2011. Benefits from reallocation of supplies would be based on the sale of SWP or other supplies. The value of transfers is based on existing demand and historic hydrology. Unforeseen regulation and changes in historical hydrology due to global climate change are factors that may significantly increase the benefit from the sale of excess supplies. For example, additional SWP pumping restrictions in the Delta or reoperation of the SWP system due to regulatory or infrastructure changes would likely increase the future value of surplus supplies.

Table 11-6, Annual Cost of Project
(Costs in 2009 Dollars)
Project 6: Goleta Sanitary District, Wastewater Treatment Plant Upgrade

	Initial Costs	Operations and Maintenance Costs [1]						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
YEAR	Grand Total Cost From Table 7 (row (i), column(d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a) +…+ (f)	Discount Factor	Discounted Costs (g) x (h)
2009	$0	$0	$0	$0	$0	$0	$0	1.000	$0
2010	$0	$0	$0	$0	$0	$0	$0	0.943	$0
2011	$4,908,107	$0	$0	$0	$0	$0	$4,908,107	0.890	$4,368,215
2012	$20,859,456	$0	$0	$0	$0	$0	$20,859,456	0.840	$17,521,943
2013	$4,908,107	$0	$0	$0	$0	$0	$4,908,107	0.792	$3,887,221
2014	$0	$0	$610,000	$0	$0	$0	$610,000	0.747	$455,670
2015	$0	$0	$610,000	$0	$0	$0	$610,000	0.705	$430,050
2016	$0	$0	$610,000	$0	$0	$0	$610,000	0.665	$405,650
2017	$0	$0	$610,000	$0	$0	$0	$610,000	0.627	$382,470
2018	$0	$0	$610,000	$0	$0	$0	$610,000	0.592	$361,120
2019	$0	$0	$610,000	$0	$0	$0	$610,000	0.558	$340,380
2020	$0	$0	$610,000	$0	$0	$0	$610,000	0.527	$321,470
2021	$0	$0	$610,000	$0	$0	$0	$610,000	0.497	$303,170
2022	$0	$0	$610,000	$0	$0	$0	$610,000	0.469	$286,090
2023	$0	$0	$610,000	$0	$0	$0	$610,000	0.442	$269,620
2024	$0	$0	$610,000	$0	$0	$0	$610,000	0.417	$254,370
2025	$0	$0	$610,000	$0	$0	$0	$610,000	0.394	$240,340
2026	$0	$0	$610,000	$0	$0	$0	$610,000	0.371	$226,310
2027	$0	$0	$610,000	$0	$0	$0	$610,000	0.350	$213,500
2028	$0	$0	$610,000	$0	$0	$0	$610,000	0.331	$201,910
2029	$0	$0	$610,000	$0	$0	$0	$610,000	0.312	$190,320
2030	$0	$0	$610,000	$0	$0	$0	$610,000	0.294	$179,340
2031	$0	$0	$610,000	$0	$0	$0	$610,000	0.278	$169,580
2032	$0	$0	$610,000	$0	$0	$0	$610,000	0.262	$159,820
2033	$0	$0	$610,000	$0	$0	$0	$610,000	0.247	$150,670
2034	$0	$0	$610,000	$0	$0	$0	$610,000	0.233	$142,130
2035	$0	$0	$610,000	$0	$0	$0	$610,000	0.220	$134,200
2036	$0	$0	$610,000	$0	$0	$0	$610,000	0.207	$126,270
2037	$0	$0	$610,000	$0	$0	$0	$610,000	0.196	$119,560
2038	$0	$0	$610,000	$0	$0	$0	$610,000	0.185	$112,850
2039	$0	$0	$610,000	$0	$0	$0	$610,000	0.174	$106,140
2040	$0	$0	$610,000	$0	$0	$0	$610,000	0.164	$100,040
2041	$0	$0	$610,000	$0	$0	$0	$610,000	0.155	$94,550
2042	$0	$0	$610,000	$0	$0	$0	$610,000	0.146	$89,060
2043	$0	$0	$610,000	$0	$0	$0	$610,000	0.138	$84,180
2044	$0	$0	$610,000	$0	$0	$0	$610,000	0.130	$79,300
2045	$0	$0	$610,000	$0	$0	$0	$610,000	0.123	$75,030
2046	$0	$0	$610,000	$0	$0	$0	$610,000	0.116	$70,760
2047	$0	$0	$610,000	$0	$0	$0	$610,000	0.109	$66,490
2048	$0	$0	$610,000	$0	$0	$0	$610,000	0.103	$62,830
2049	$0	$0	$610,000	$0	$0	$0	$610,000	0.097	$59,170
2050	$0	$0	$610,000	$0	$0	$0	$610,000	0.092	$56,120
2051	$0	$0	$610,000	$0	$0	$0	$610,000	0.087	$53,070
2052	$0	$0	$610,000	$0	$0	$0	$610,000	0.082	$50,020
2053	$0	$0	$610,000	$0	$0	$0	$610,000	0.077	$46,970
2054	$0	$0	$610,000	$0	$0	$0	$610,000	0.073	$44,530
2055	$0	$0	$610,000	$0	$0	$0	$610,000	0.069	$42,090
2056	$0	$0	$610,000	$0	$0	$0	$610,000	0.065	$39,650
2057	$0	$0	$610,000	$0	$0	$0	$610,000	0.061	$37,210
2058	$0	$0	$610,000	$0	$0	$0	$610,000	0.058	$35,380
							Total Present Value of Discounted Costs (Sum of Column (i))		**$33,246,829**
							Transfer to Table 20, column (c), Exhibit F: Proposal Costs and Benefits Summaries		
Comments: The expected useful life of the project is over the entire period of analysis, 48 years.									

(1) The incremental change in O&M costs attributable to the project.

PROJECT 7:

City of Guadalupe, Recycled Water Feasibility Study

Project 7: City of Guadalupe, Recycled Water Feasibility Study

The City of Guadalupe (City), a DAC, is completing an upgrade to its wastewater treatment plant. Concurrent with the implementation of the current upgrade, it would be realistic and a relatively straightforward process to upgrade the plant to tertiary treatment. A comprehensive recycled water feasibility study (Study) is required to adequately assist the City in identifying the best use of the City's treated water resources and best design of the recycled water distribution system. The proposed Study (Project 7 or Project) will evaluate and describe the costs and benefits of recycled water opportunities and may lead to a construction project that would address the City's water supply needs. Without Prop 84 funds, the City does not have any sources of funding to undertake the Study.

Costs

The costs associated with the Study have been determined; however, the costs of constructing a future project based on the Study are speculative; therefore, the costs of Project 7 are not presented quantitatively.

Water Supply Benefits

Avoided Water Supply Purchases

Identifying opportunities to provide recycled water, as well as identifying the economic feasibility of those opportunities, will directly benefit the City by providing it with a decision-making and planning tool for eventual tertiary upgrade and provision of recycled water. Improving wastewater effluent will reduce the demand for purchase of imported water and demand on groundwater. With the required wastewater plant upgrades, which would be justified based on the Study, effluent will be treated to tertiary levels and used for landscape irrigation and other potential customers. If the City completes a tertiary treatment upgrade, the volume of water used for landscape irrigation will likely be 150 AFY. Although probable, the benefits of constructing a project based on the Study are speculative at this time; therefore, the benefits of Project 7 are discussed qualitatively.

Distribution of Benefits and Identification of Beneficiaries

The beneficiaries from the Study and possible construction of the wastewater treatment plant improvements will be the residents of the City of Guadalupe. The avoided water supply purchases, decreasing the use of groundwater, would provide significant benefits if the City upgrades its wastewater treatment plant facilities to tertiary and provides recycled water to its customers, who are residents of a DAC. Eventual upgrade would offset costs associated with pumping of groundwater and purchase of SWP water, thereby directly benefitting water resources.

Benefits Timeline

If the Study finds the upgrade to be feasible and the upgrade is implemented, benefits could commence as early as 2014 (upon completion of an upgrade) and accrue for 30 years.

Potential Adverse Effects and Uncertainties

There are no potential adverse effects or uncertainties related to the Study.